

4318

Diag. Cht. No. 8202-2

Form 504

U. S. COAST AND GEODETIC SURVEY

DEPARTMENT OF COMMERCE

DESCRIPTIVE REPORT

Type of Survey HYDROGRAPHIC - WIRE DRAG

Field No. _____ Office No. H-4318

LOCALITY

State SOUTHEAST ALASKA

General locality CROSS SOUND

Locality LEMESURIER ISLAND TO CAPE SPENCER

194/

CHIEF OF PARTY

J. H. Hawley

LIBRARY & ARCHIVES

DATE MAY 11, 1921.

4318

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U.S.C. & G. SURVEY
HYDROGRAPHY
SALES
GEODESY

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY MAY 11 9 35 AM '21

April 28, 1921

MAY 6 1921 10 54 AM

To: The Director, Coast and Geodetic Survey

From: Commanding Officer, Str. EXPLORER

OFFICE
LIBRARY
MAGNETISM
CHARTS (2)

SEATTLE FIELD STATION

Subject: Report on search for reported shoal near Lemesurier Island.

1. In accordance with telegraphic instructions a search was made for a reported shoal near Lemesurier Island, Icy Strait. While unsuccessful in finding the shoal the performance was noteworthy in that a new method of making such a search was effectively put into use. The report will accordingly be quite detailed.

2. Source of information. Mr. G. C. Jones while en route to Alaska heard a report as to an uncharted dangerous rock in the vicinity named but as he did not see a chart at the time was unable to note the exact locality. Later he investigated further when the ADMIRAL WATSON was in port and came to the conclusion that their report was due to a wrong idea of the position of the 1 1/2 fm. rock east of entrance to South Inian Pass. At the same time however there was a report from the captain of the cannery tender John L.C. that fishing gear had caught in apparently quite shoal water, that a dory loaded with fish had been overturned by an apparent breaker at an extremely low tide and that a break had been seen in the same vicinity on another similar occasion. This seemed enough evidence to warrant investigation. At the same time it seemed useless to attempt a search without a sweep.

Preparations. A single vessel sweep and arrangements were made to keep the various parties at work so that the search would cost nothing but the extra coal consumed. The crew retained aboard was a minimum, as a primary triangulation & a tertiary tri., parties continued at work and men were at work in Juneau on launches, special installations and wire drag equipment.

Program followed. On Monday April 25 vessel proceeded to Station Point, Stephens Passage and left Mr. Senior and party in camp from Primary Triangulation. Vessel then proceeded to Hooniah Harbor and anchored for the night. April 26 proceeded to locality of shoal arriving 9.00 AM, made thorough investigation with single vessel sweep, and anchored for night at Inian Cove. April 26 returned to Juneau en route to Taku to get repaired clock for tide gauge and minor supplies.

Survey methods. Commanding Officers have had the same problem in the past- a reported shoal in deep water and no drag launches available to make a thorough examination. Soundings are practically useless and detailed examination with the eye is scarcely sufficient. This problem may be considered solved and a single vessel can now make a final investigation provided the control is of sufficient accuracy. In this case the control consisted of three point fixes on tangents and this was not accurate enough for overlapping the lines. Accordingly no attempt was made to do this. Lines were placed close together and the area for several hundred meters on each side was carefully examined with the eye for such indications as kelp, discolored water or unusual swirls. It is not considered possible that any rock however small could have escaped this search.

Details of single vessel sweep. The use of this sweep recalls the pipe drag but with a marked difference in effectiveness. The pipe drag as I remember had an effective width of 30 feet and a maximum depth of 30 feet. The single vessel sweep used which was not a completely developed sweep for the purpose but simply the apparatus as previously assembled, had an effective width of 112 meters and depth considerably in excess of 50 feet.

Actual length of wire was 1400 feet and this wire was continuous, the attachments being made by passing shackles over the swivel at the connection points as in the case of the sweep. the length of bottom wire was 600 feet, the two uprights were 100 feet each and the toelines 300 feet each. Sinkers were two 35 lbs. weights fastened together for each upright. Spreaders were those previously used in tests in Lake Washington except that new buoyancy tanks had been installed adding immensely to their efficiency.

Setting out. Setting the bottom wire out without fouling was the most difficult problem. the method followed was to take the end of the wire which was carried on the new steam winch (on the starboard side of quarterdeck) around stern to port side and make fast. The bight of wire was then paid out from the starboard side floats being attached each 100 feet. It was found that the 30 foot spread thus obtained permitted each successive float to drift past those set out before until the entire 600 feet was out in a narrow bight astern. The vessel went ahead occasionally at slow speed to keep tension on both parts. after the 600 feet was out the sinker was attached and lowered then the starboard spreader. As soon as this was in the water (having been lowered by block and tackle in the same manner as customary for the sweep buoys) they tended to go out to position. It is necessary to check them occasionally with winch as otherwise they may drift too straight astern. The slightest tension will cause them to go out. As soon as the towline is out the end is disconnected from wire on reel and led through a fairleader to the starboard bitt and this part of the drag is ready for action. Wire on winch is then connected to end of bottom wire held aboard. As the spreader is now well off to starboard it is practicable to payout the upright and port spreader from the starboard side. The same procedure as for the starboard side is followed and end of towline is attached to port bitt. The setting out took 25 minutes but this time could be easily reduced with an improved system and more experience. Probably the best way would be to wind half sweep on each side of drum and pay out port side through snatch blocks, setting out both sides at the same time.

Speed and effect of current. As soon as sweep was out vessel proceeded at half speed and held this speed throughout day the average for the entire period being 5 statute miles per hour. This is by no means a maximum but it was suited to the strength of the wire and to the splicing of the lines. On a 180° turn the outer spreader speeds up and the inner slows down. As soon as turn is completed they rapidly take their proper station. The entire length of the towline except the last 30 feet is out of the water and with smooth water is nearly a straight line. There were strong currents in the area examined but with the speed named control was not difficult. At one time it was necessary to change course 30 degrees to retain a straight line. It may be stated that Mr. B. H. Rigg with limited experience in charge of hydrography had no difficulty in operating the vessel.

Effective width and depth. With spreaders as used the normal angle between towline and direction of progress was 35 and 40 degrees respectively the difference probably being due to slight difference in detail of attachments to spreaders. This corresponded to an effective width of 120 meters. The width varied from 110 to 130 meters under varying conditions of current. It was noted that width could be determined by a single angle taken on the bridge between the spreaders. This varied from 41 to 45 degrees with an average value of 43 which held most of the time. The actual depth was not determined. It was found however that

it was in excess of 54 feet. A weight was attached to a piece of line with a stick of sufficient buoyancy to carry it. This was dropped over from the stern. It was upright long before the sweep reached it and the sweep wire passed under it without catching it.

It should be noted that the effective width of the wire drag at $1\frac{1}{2}$ miles per hour is about 80 per cent of length of bottom wire, for sweep at 8 miles 75% and for single vessel sweep at 5 miles 67%. There is little doubt that the last figure can be increased.

Taking up sweep. This presented no problem. The starboard side was taken in with the vessel stopped. As soon as half the bottom wire was in the end was let go and the port side taken in in the same manner as the starboard side. The only point to observe is not to haul in the spreaders too fast as any increase in speed tends to make them shoot out and pull harder.

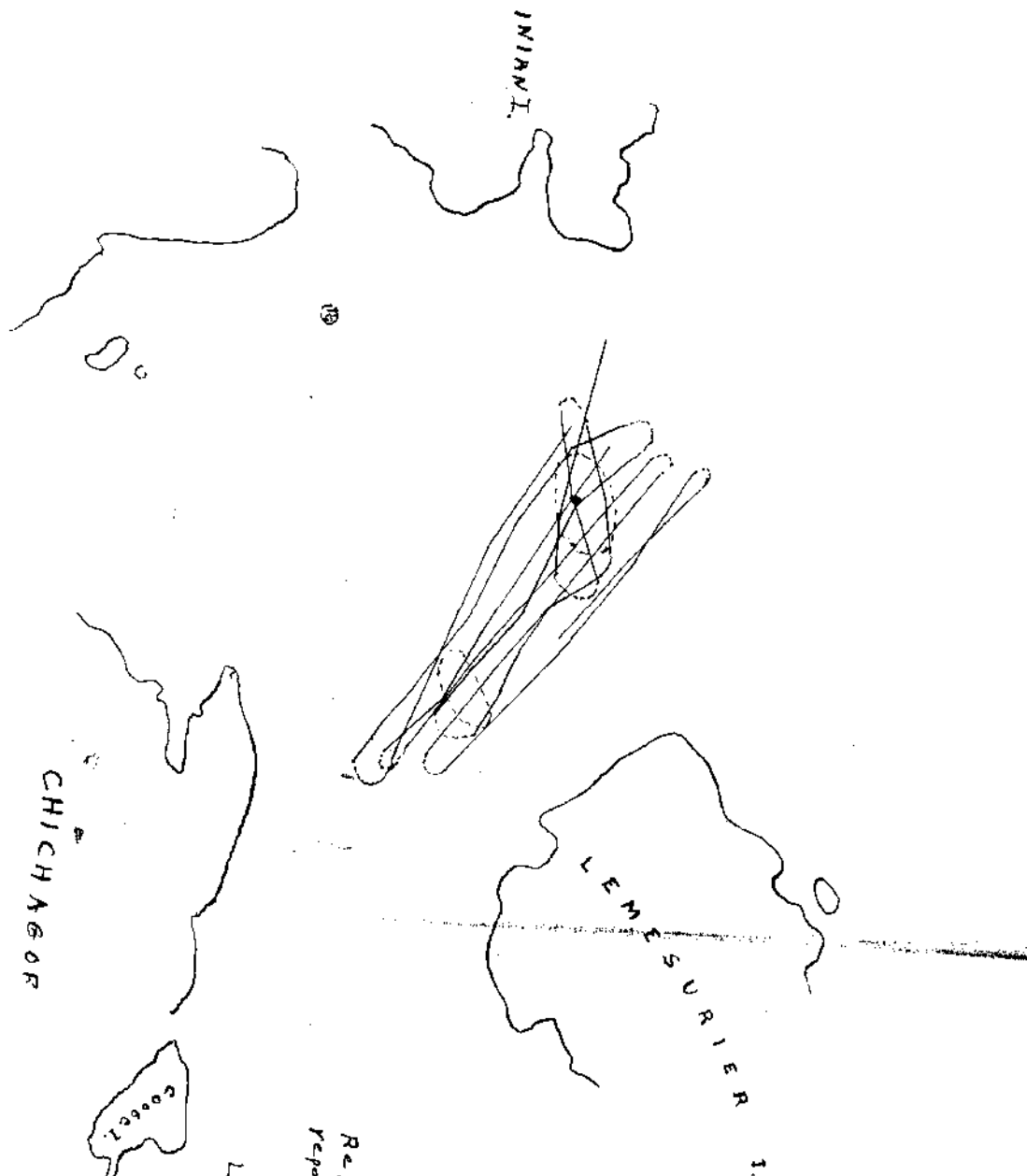
Conclusions. With reference to shoal that those reporting it have been misled either in deduction of its existence or else it has been confused with the shoal previously mentioned east of South Indian Pass. It is considered conclusive that no such shoal exists.

That the search was well worth while for several reasons. It demonstrated that the vessel may now leave detached parties for several days without interference with work. It was shown that any Coast Survey vessel may if equipped with a single vessel sweep and winch or reel for handling it make a far more effective search for a pinnacle rock than can be made by sounding. That such a search can be made at more than sounding speed. It is considered that with improved details a longer sweep is entirely practicable- a point in which I have been heretofore in some doubt.

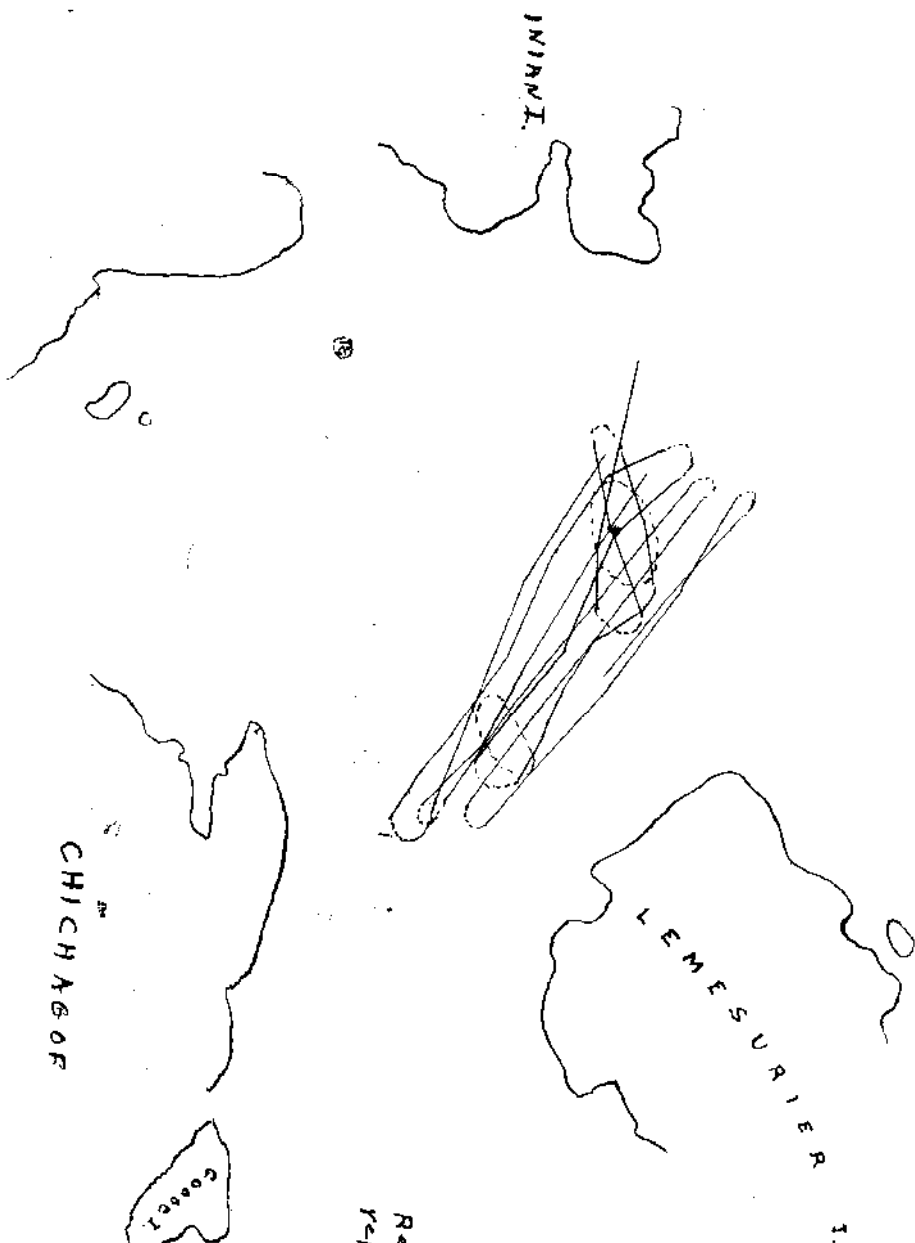
Incidental to the special survey but of possible future value is the fact that at this time Icy Strait was practically free from ice- there being very much less than in the approach to Holkham Bay. Possibly a dozen pieces were seen while en route in both directions. The strength of the currents were noted and it is clear that the sweep with its high speed will prove vastly more effective than a drag for the deep water work.

N. H. Heck

N. H. Heck
Commanding Officer



Report on search for
 reported shoot
 N.H. Hays Comd. EXPLORER
 April 28, 1921
 Lines show path of Sigsbee vessel
 Sweep effective within 115 Meters
 Dotted red line indicates reported positions
 Chart 8389



Report on search for
reported shoot.

N.H.H.W. Comd. EXPLORER

April 28, 1921

Lines show path of single vessel
which is effective within 115 miles
Dotted red line indicates reported position
Chart 8304

DESCRIPTIVE REPORT
TO ACCOMPANY WIRE DRAG SHEET #4.

ley Strait

Port Althorp

Cross Sound

S. E. Alaska.

Season 1923.

-
USS EXPLORER.

Date of this report
January 22, 1924.

DESCRIPTIVE REPORT

to accompany Wire Drag Sheet # 4.

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This report is made in accordance with instructions issued to Captain J. H. Hawley, dated February 16, 1923.

Location:

The dragging and sweeping on this sheet extends thruout Icy Strait, S. E. Alaska from about longitude 136° 00' W thru Cross Sound to about longitude 136° 45' W and here at the western end between latitudes 58° 03' N to 58° 12' N in the Pacific Ocean. Or, all of Icy Strait from the east end of Lemesurier Id. to the westward including North and South Inian Passes, Port Althorp and entrances, and Cross Sound for a distance beyond Cape Spencer and Cape Bingham of approximately three miles into the Pacific Ocean.

This sheet joins and overlaps sheet #3 on the east.

Shoals:

The following shoals were found:

Icy Strait

1. One quarter of a mile off the west point of Willoughby Cove, 44 feet in charted depth of perhaps 27 fathoms.
2. A rocky reef makes out about 1/8 mile with less than 5 fathoms from the NE point of Earl Cove. Also with 6 fathoms about the same distance off signal Cag at the NE point of South Inian Pass.
3. Several shoal spots ~~were~~ just south of South Inian Pass buoy. The shoalest, 13 feet, 1 1/4 miles east of Signal Date, and 1/2 mile south of the located position of the buoy. It is also 1/3 mile south of the charted location of the 1 1/4 fathom shoal which the buoy marks.

Cross Sound

4. On the 1/2 fathom shoal, chart #8304, just north of George Islands, 51 feet.
5. One third mile NE and NW of Gaff Rocks several shoal spots, the least being 29 feet.
6. One quarter mile N of the small rocky island 3 miles west of Pt. Lunan, 36 feet.
7. One third mile N of Soapstone Pt, 20 feet.
8. One quarter mile W of Yakobi Rock, 35 feet.
9. Three quarters mile SW of signal Cad at Cape Bingham, 46 feet.
10. Three miles WSW of Cape Spencer Light, 80 feet, in a charted depth of 30 fathoms.
11. Two miles SSW of Cape Spencer Light, 66 feet, in a charted depth of 44 fathoms.
12. One half mile NE of Signal Bar, 52 feet, at the 50 fathom curve.
13. On the 36 fathom shoal, 3 miles SE of signal Ave, 63 and 70 feet.
14. On the large shoal about 3 miles N of Soapstone Point 4 shoaler spots, the shoalest 41 feet in 12 fathoms charted.

Port Althorp.

15. The pinnacle rock in the center of the fairway to Port Althorp just north of Three Hill Id. by sounding 46 feet and 33 feet. The drag caught drawing 34 feet. on Z - day. On C' - day the drag hung up here at the latter shoal drawing 27' but unfortunately some of the buoys were towed under.

No sounding was obtainable due to the strong currents, and the very small size of the pinnacle. On "D" day this pinnacle was dragged over with 27 feet effective, under perfect conditions in all respects and the drag did not hang up.

- ✓16. One fourth mile north of Three Hill Island in the main ship channel to Port Althorp 32 feet with kelp.
- ✓17. One fourth mile N.W. of Althorp light 61 feet in 24 fathoms charted.
- ✓18. One eight mile south of Althorp Light 32 feet.
- ✓19. One third mile S.E. of Althorp Light 72 feet in 33 fathoms.
- ✓20. One half mile E.S.E. of the Deep Sea Salmon Co.'s cannery (Can C) 21 feet and 26 feet in 13 to 15 fathoms charted.
- ✓21. At the head of Port Althorp 28 feet off C Ball.

Splits:

Approximately one mile east of the position of South ^{Indian} ~~Main~~ Pass buoy on this sheet is a small split. At the time this area was done the buoy was in this split having dragged east from its correct position.

Between 34A' and 35 A', guiding launch positions, half way between signals Fog and Adze, off S. Indian Pass, there is a near split.

Off Cape Spenser at guiding launch position 4, "J" day, and E. Launch position 8, "T" day, there is a near split.

Sweep and Deep Drag:

Except the fringe close to shore and over the shoals in the center of Cross Sound the area on sheet #4 is all covered either by the sweep set at 110 feet or by the deep drag. North and South Passage and North ^{Indian} ~~Main~~ Pass were swept. An effective depth of 81 feet was taken through South Indian Pass. The north pass to Port Althorp was dragged to 49 feet. Between the shoals off Three Hill Light and the pinnacle of 33 feet in the fairway ⁴⁸ feet channel ^{was} dragged. South entrance to Port Althorp was dragged to 31 feet. The channel between Althorp rocks and Three Tree Island is dragged to 29 feet. A deep drag was used in Port Althorp with a shoal drag of about 40 feet close to shore.

Submerged Rock:

The submerged rock about 6/10 of a mile north of signal Jog was dragged over with 24 feet effective and it was not found. An "old timer" at Hoonah said in regard to this rock that a ship had struck an iceberg in North Passage off Lemesurier Island caving in the bow badly, and filling with water. An endeavor was then made to beach the ship at Mud Bay but as the head went down the rudder became less effective and the best that could be done was to get the ship ashore off signal Jog. In this vicinity the captain maintained a bulkhead let go but the passengers maintained a rock was struck, and this submerged rock is said to mark the spot. It is believed this rock does not exist.

Anchorage:

The EXPLORER used Mud Bay, Indian Cove and Head of Port Althorp for anchorages.

Willoughby Cove was used once but a strong cross eddy sweeps in bringing dangerous icebergs when iceberg conditions are present. It is not considered a good anchorage.

Dunk Hole at north entrance to Port Althorp is spoken of as a good halibut boat anchorage during winter.

Fox Islands:

The following islands in the past season's work are fox islands:

Sisters
 Porpoise
 Pleasant
 Hoonah
 Halibut
 Lemesurier
 Shaw
 Inian Islands
 George Islands
 Three Hill Islands.

Tides:

Observed highest tide at Mud Bay August 24, 1923, 12:10 P.M. (+)12.3 above MLLW.
 Observed lowest tide at Mud Bay May, 17, 1923, 7:50 A.M. (-)1.1 " "
 Observed highest tide at Port Althorp, July 29, 1923, 1:07 A.M. (+)12.3 " "
 Observed lowest tide at Port Althorp June 30, 1923, 9:30 A.M. (-)1.7 " "

Guiding and End launches:

Except at A Jog, through South Inian Pass, around the buoyed, Port Althorp entrances and its head all work was done by the ship and launch SCANDINAVIA. In the places named the launch SCANDINAVIA and Tender "1" were used. In all cases both guiding launch and end launch worked with individual boat sheet control.

Coloring:

On the smooth sheet the system of coloring is as follows:

19 feet and under - - - - Brown
 20 to 29 feet - - - - Yellow
 30 to 39 feet - - - - Blue
 40 to 59 Feet - - - - Red
 60 to 79 feet - - - - Purple
 80 feet and over - - - - Orange.

Charles Shaw

Charles Shaw, Commanding Str. EXPLORER.

Note: This report should be referred to Captain J. H. Hawley for additional remarks if desirable.

Statistics. Wire Drag Sheet No. 4.

Date 1923	Letter	Volume	Positions	Soundings	Statute Miles	Vessels
June 13	A	1	34		20.5	Scandinavia &
14	B	1	45		22.3	Explorer
15	C	1	46		25.7	" "
25	D	1	58		26.7	" "
27	E	1	32		14.7	" "
28	F	1	25		10.4	" "
29	G	2	27		9.7	" "
July 12	H	2	27		10.2	" "
16	J	2	45		20.0	" "
17	K	2	48		23.9	" "
19	L	2	48		15.5	" "
20	M	2	25		11.2	" "
25	N	2	43	4	11.6	" "
26	P	3	45	4	12.8	" "
27	Q	3	18	10	3.9	" "
28	R	3	10	3	4.0	" "
30	S	3	10	1	4.0	" "
31	T	3	40	3	13.9	" "
AUG, 1	U	3	40	2	9.8	" "
2	V	3	63	3	10.3	" "
3	W	3&4	48		7.5	" "
11	X	4	57	4	12.7	" "
13	Y	4	14		4.0	" "
14	Z	4	39	5	5.3	Scandinavia &
15	A'	4	61	2	9.2	Tender #1
16	B'	4	55		8.2	" "
17	C'	4&5	13		1.8	" "
18	D'	5	26		4.1	" "
20	E'	5	30	1	8.3	Scandinavia &
21	F'	5	32	10	6.8	Explorer
22	G'	5	26		6.3	" "
23	H'	5	37	11	5.4	" "
24	J'	5	21		5.4	" "
31	K'	5	30	1	5.4	Scandinavia &
Sept. 1	L'	5&6	40	3	7.1	Tender #1
Totals			1258	67	378.6	

Automatic tide gauge at Hoonah and staff gauges at Mud Bay and Port Althorp.

ADDRESS THE DIRECTOR
U. S. COAST AND GEODETIC SURVEY

AND REFER TO No. 4-DEM

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

WASHINGTON

July 9, 1924.

SECTION OF FIELD RECORDS

Report on Wire Drag Sheet No. H-4318

Surveyed in 1923

Instructions dated February 16, 1923

Chief of Party, J. H. Hawley.

Surveyed by J. H. Hawley, Charles Shaw, W. D. Combs.

Protracted and inked by H. E. MacEwen.

Verified and Area and Depth Sheet by A. L. Shalowitz.

1. The records conform to the requirements of the General Instructions.
2. The methods and character of operations fulfill the requirements of the General Instructions.
3. The depth and extent of dragging satisfy the specific instructions except that in the shoaler area about 3 miles north of Soapstone Pt. the drag should have been carried to within 3 feet of the bottom. Also in South Passage north of Quartz Pt. the drag should have been set deeper than 25 feet.
4. A clearance depth sufficient for surface navigation in the particular locality was found on all shoals discovered by the drag except as follows:

a. The 35' sounding near Cape Bingham was not cleared. The drag caught here and slipped off. It is therefore not necessary to drag over this spot owing to its proximity to the shore. The present chart shows 5 fathoms at this spot. This should be changed to 5 3/4 fathoms as the 5 fathoms was an advance report from the Chief of Party. See letter 306 - 1923.

b. The 20' sounding off Soapstone Pt. was not subsequently cleared. As the hydrographic sheet for this locality shows deeper water inside the 20' sounding, it is possible that less water exists here. The 2 1/2 fathom sounding charted here should for the present be changed to 3 1/4 fathoms as the 2 1/2 was advance information from the Chief of Party before the work was plotted up. See letter 306 - 1923.

- c. The 36' sounding off \odot Par was not dragged over. As this is close to the reef that makes off \odot Par, it is unnecessary to drag this.
- d. The 32' sounding southeast of Δ Alt was not cleared. This being so close to the reef it hardly seems necessary to drag over it.
- e. The 21' and 26' soundings in Port Althorp were not dragged over. As these are near the Deep Sea Salmon Co. Cannery Dock they should be dragged over to determine the least water.
- f. The 28' sounding near the head of Port Althorp was not cleared. This is close to shore and is unnecessary.
- g. The 33' sounding off the north end of Three Hill I. was not dragged over. It is outside the limits of the drag. It was probably not covered on account of the kelp in the vicinity, although it would have been desirable to drag a little closer to Three Hill I. so as to widen the entrance to Port Althorp.
- h. The 29' and 39' soundings north of Gaff Rock were not cleared.
- i. The 13' sounding at the east end of South Inian Pass and south of the nun buoy was not dragged over. A thorough sounding in the vicinity of the grounding revealed no shoaler water than the effective setting of the drag which was 13', although the drag remained hung up. The strong currents which existed at the time would have made it difficult to obtain a good up and down cast, and if anything a greater depth than actually exists would have been obtained. It is therefore very probable that less than 13 feet of water exists here.
- j. The 44' sounding near Willoughby Cove was not cleared and hence is not the shoalest water here.
- k. The 52' sounding off Δ Bar was not cleared. This sounding does not represent an actual sounding but the effective depth at which the drag grounded.
- l. The shoal soundings off the north point of Earl Cove were not dragged over. These are on a rocky reef that makes out from the point.

m. The 48 foot sounding off Cape Bingham was not subsequently cleared. The bottom is foul from here inshore. The smooth sheet shows the 25 foot portion of the drag as having grounded, but it is possible that the grounding occurred before the buoy was hooked up to 25. (See note at 44 P, page 10, Vol. 3, sounding record.)

5. The overlaps are sufficient except as shown on the A. and D. sheet.
6. There are two small splits on this sheet. The first is at the 13' spot mentioned in Paragraph 4 (1). The second is east of the South Inian pass buoy. This split was caused by the buoy having dragged to this position at the time the work was done here.
7. If work is done here in the future the places mentioned in Paragraph 3 and the important places mentioned in Paragraph 4 should be investigated. Also the places with insufficient overlaps as indicated on the A. and D. sheet. Through South Inian Pass the drag should be carried closer to the north and east shores of Inian Islands, particularly in the vicinity of Δ Fake and Δ Cage.
8. Attention is called to the fact that the pinnacle rock in the center of the fairway to Port Althorp just north of Three Hill Island, and now charted as 5 1/2 fathoms, should be changed to 4 1/2 fathoms. The shoalest actual sounding obtained here was 33 feet. Subsequently the drag grounded set at 27 feet effective depth. (See Vol. 5, page 2) On account of the strong current no sounding was obtained. The buoys towed under somewhat. No drag test is given in the records, but a 1 foot lift is applied. On the following day under good conditions with the drag set again at 27 feet, the drag passed over this spot. These was no lift on this day. It is possible that on the previous day when the grounding took place there was no lift and that the drag grounded at 28 feet which would account for the subsequent clearing at 27 feet. However, since it is certain that there is less than 33 feet and more than 27 feet the shoalest depth at which a grounding took place, though under imperfect conditions should be charted. O.K'd by
A.L.G.
9. The 51 foot sounding off Δ Adze was obtained when a 49 foot effective drag grounded. The spot was subsequently cleared by a 37 foot drag. A 49 foot sounding is not shown here, because it is possible that the grounding took place with the drag actually set at 51 feet effective depth, as the records apply a 2 foot lift correction without showing any actual drag test having been made. O.K'd by
A.L.G.
10. The field plotting was completed to the extent prescribed in the General Instructions.
11. Except for a few changes, the office draftsman did not have to do over any part of the drafting done by the field party.

- 12. Rating of work {
 - (a. Character and scope of drag operations - excellent.
 - (b. Field drafting - excellent.
- 13. No verification report for this sheet was made, the substance being incorporated in this review.
- 14. Reviewed by A. L. Shalowitz, July, 1924.

One copy for field records

February 20, 1924.

Division of Hydrography and Topography:

Division of Charts:

Tide reducers are approved in
volumes of sounding records for
wiring.

HYDROGRAPHIC SHEET 4519.


Locality: Icy Strait, Lemnaur Island to Cape Spencer, S.E. Alaska.

Chief of Party: J.H. Hawley in 1923.

Place of reference is mean lower low water reading
on tide staff at Port Althorp
4.6 ft. and Bay.

For reduction of soundings, condition of records satisfactory
except as checked below:

1. Locality and sublocality of survey omitted.
2. Month and day of month omitted.
3. Time meridian not given at beginning of day's work.
4. Time (whether A.M. or P.M.) not given at beginning of day's work.
5. Soundings (whether in feet or fathoms) not clearly shown in record.
6. Leadline correction entered in wrong column.
7. Field reductions entered in "Office" column.
8. Location of tide gauge not given at beginning of each day's work.
9. Leadline corrections not clearly stated.
10. Kind of sounding tube used not stated.
11. Sounding tube No. entered in column of "Soundings" instead of "Remarks".
12. Legibility of record could be improved.
13. Remarks.



Chief, Division of Tides and Currents.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

4318

HYDROGRAPHIC TITLE SHEET

The finished Hydrographic Sheet ^{Wire Drag Sheet #4.} is to be accompanied by the following title sheet, filled in as completely as possible, when the sheet is forwarded to the Office.

U. S. Coast and Geodetic Survey.

Register No. 4 4318

State S. E. Alaska.

General locality ~~Icy Strait and Cross Sound.~~

Locality Lemesurier I. to Cape Spencer.

Chief of party J. H. Hawley

Surveyed by J. H. Hawley, Charles Shaw, W. T. Combs.

Date of survey 1923

Scale 1 to 40,000

Soundings in feet

Plane of reference M.L.L.W.

Protracted by H.E.M. ^{as given} Soundings in pencil by H.E.M.

Inked by H.E.M. ^{wire drag} Verified by C.S.

Records accompanying sheet (check those forwarded):

¹ Des. report, Tide books, Marigrams, 4 Boat sheets,
1 Sounding books, 2 Wire-drag books, Photographs.

Data from other sources affecting sheet

Topographic Sheet #C(Location Port Althorp signals)

Remarks: